Hiroto KOKUBUN et al., Application No. 10/593,359   Dkt. 1141/76910
Page 11

Amendments to the Drawings

The replacement sheets of drawings attached hereto as **Exhibit A** include changes to, and replace, Figure 9 of the original sheets of drawings. Applicant submits that no new matter is introduced in the replacement Fig. 9.

The label "scann" has been removed.

Attachment: replacement sheet of drawings for Figure 9

Hiroto KOKUBUN et al., Application No. 10/593,359   Dkt. 1141/76910
Page 12

REMARKS

Claims 1-21 were pending. By this Amendment, claims 9, 14, 15, 18 and 19 have been canceled, without prejudice or disclaimer, claims 1 and 16 have been amended to place the claims in better form for examination and to clarify the claimed subject matter, and new claim 22 has been added. Claims 1-8, 10-13, 16, 17 and 20-22 would be pending upon entry of this Amendment, with claims 1, 16 and 22 being in independent form.

The drawings were objected to as having informalities.

By this Amendment, the application has been amended to address matters as referenced in the Office Action and otherwise.

Withdrawal of the objection to the drawings is respectfully requested.

Claims 1, 2, 9, 14-16, 18 and 19 were rejected under 35 U.S.C. § 102(b) as purportedly anticipated by Yavuz et al. (US 6,539,074). Claims 3, 11, 13 and 21 were rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Yavuz. Claim 20 was rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Yavuz in view of Pan et al. (US 2003/0163039 A1).

Applicant respectfully submits that independent claims 1 and 16 of the present application are allowable over the cited art, for at least the reason that the cited art does not disclose or suggest the aspects of (a) obtaining a time range so that the time resolution is within a desired range on an image data collection condition based on the periodic motion data and a relationship among a time resolution of an image obtained, image data collection conditions and periodic motion, and (b) controlling an image data collection starting position such that the time range matches the image data collection range. Such aspects are discussed in the present application at, for example, paragraphs [0115] through [0122], with reference to Figs. 6 and 7 (reproduced below) of the present application. As discussed, such aspects enable images to be

Hiroto KOKUBUN et al., Application No. 10/593,359   Dkt. 1141/76910
Page 13

obtained at a preferable time resolution even when the heart rate of an object to be examined
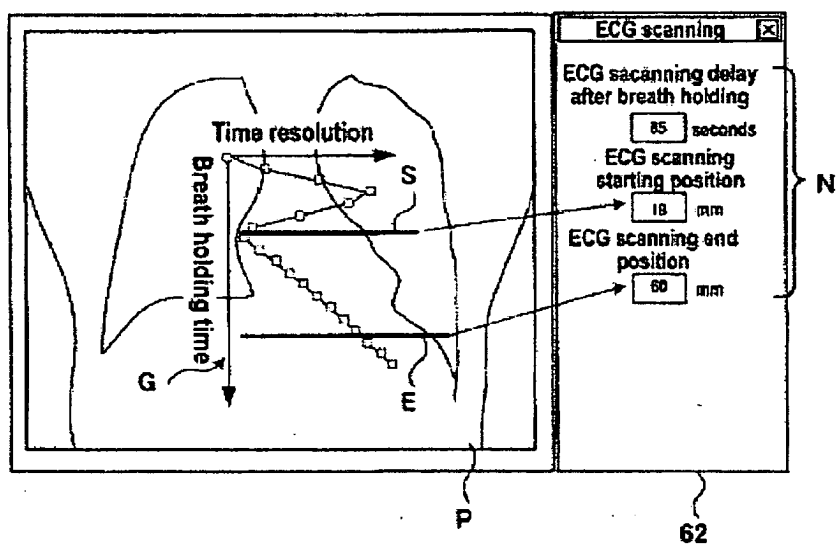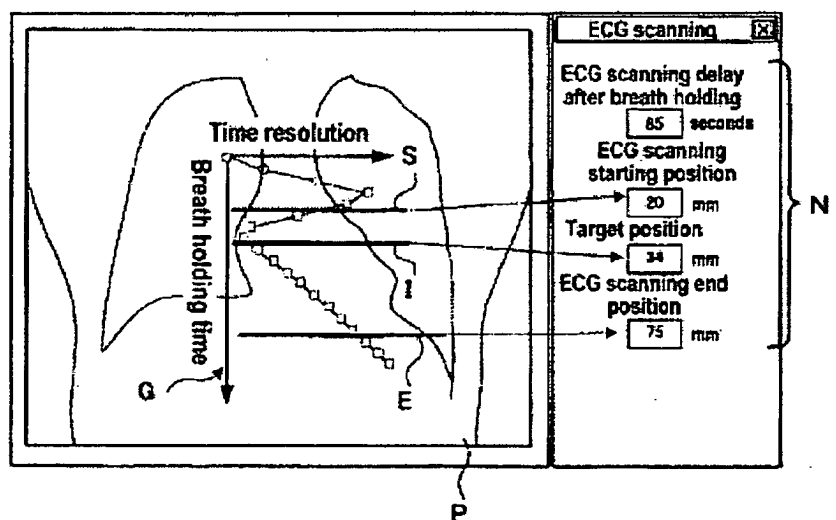
fluctuates during image data collection.

FIG. 6

FIG. 7

Yavuz, as understood by applicant, proposes an approach, as illustrated in Fig. 10

(reproduced below) of Yavuz, for reconstruction of multiple, tomographic slice images to

represent an imaged object in three spatial dimensions, using four-dimensional tomographic

projection data, including performing a basic data collection operation for obtaining three-

dimensional projection data (1010), performing an operation 820 to analyze the three-

dimensional projection data to determine a particular set of projection views at a selected view

angle for each data acquisition cycle, performing an operation 830 to provide a reconciliation

between the axial positions at which the projection views of a given set represent the object and

the axial positions at which the stacked slice images are to represent the object, and performing

an operation 840 to reconstruct several slice images at the respective specified axial positions,

including for each slice image, selecting projection views from respective ones of the sets of

projection views (or from the reconciled sets of projection views).

FIG. 10

```
        ┌─────────┐
        │  START  │
        └─────────┘
             │
   ┌───────────────────────────┐
   │ COLLECT 3-D PROJECTION DATA OVER │──1010
   │ MULTIPLE DATA ACQUISITION CYCLES │
   └───────────────────────────┘
             │
   ┌───────────────────────────┐
   │ DETERMINE SET OF PROJECTION VIEWS │
   │ AT SELECTED VIEW ANGLE FOR EACH   │──1020
   │ DATA ACQUISITION CYCLE            │
   └───────────────────────────┘
             │
   ┌───────────────────────────┐
   │ GENERATE PROJECTION VIEWS AT     │
   │ SPECIFIED AXIAL POSITIONS FOR    │──1030
   │ EACH PROJECTION VIEW SET         │
   └───────────────────────────┘
             │
   ┌───────────────────────────┐
   │ RECONSTRUCT SLICE IMAGES        │──1040
   │ AT SPECIFIED AXIAL POSITIONS    │
   └───────────────────────────┘
             │
        ┌─────────┐
        │ RETURN  │
        └─────────┘
```
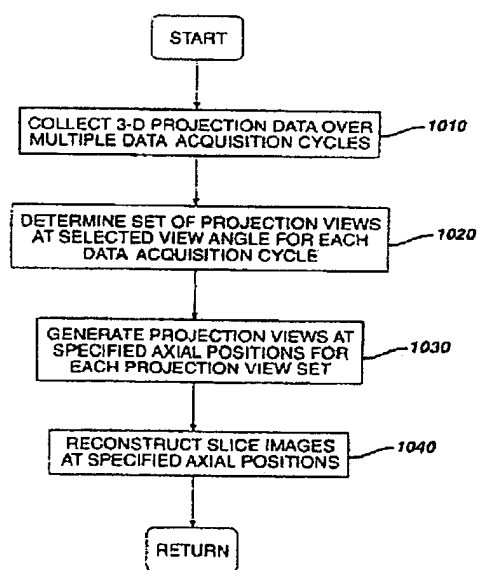
Hiroto KOKUBUN et al., Application No. 10/593,359   Dkt. 1141/76910
Page 15

Fig. 5 (reproduced below) of Yavuz shows notionally, in a cardiac imaging example, that the collection of projection data proceeds as a function of time while the gantry or source is rotating, with a projection data set consisting of numerous projection views for a single, complete scanning rotation ($0°\leq\theta\leq360°$) (representing the heart at all the different phases throughout the cardiac cycle).

FIG. 5
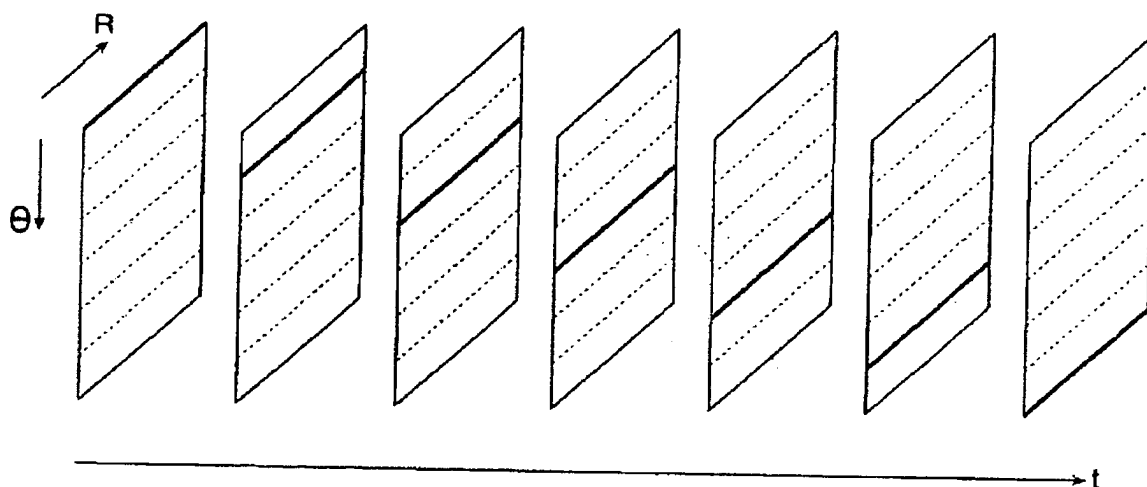
However, the approach proposed in Yavuz does NOT involve the aspect of obtaining a time range so that the time resolution is within a desired range on an image data collection condition based on the periodic motion data and a relationship among a time resolution of an image obtained, image data collection conditions and periodic motion.

To the extent that the cardiac cycle can be equated with a time range, the time resolution in Yavuz is still merely a function of data acquisition capability of the device.

Yavuz says nothing regarding obtaining a time range so that the time resolution is within

Hiroto KOKUBUN et al., Application No. 10/593,359   Dkt. 1141/76910
Page 16

a desired rang, nor that such time range is determined based in part on a relationship among a time resolution of an image obtained, image data collection conditions and periodic motion.

Further, Yavuz also fails to disclose or suggest controlling an image data collection starting position such that the time range matches the image data collection range.

Although Yavuz acknowledges that it would be desirable to obtain improved time resolution, Yavuz teaches that the improved time resolution is often obtained at the expense of more image artefacts.

Applicant submits that the cited art (including Pan), even when considered along with common sense and common knowledge to one skilled in the art, does *NOT* render unpatentable the aforementioned aspects of the present application.

Accordingly, applicant respectfully submits that independent claims 1 and 16, and the claims depending therefrom, are allowable over the cited art.

The Office Action indicated that claims 4-8, 10, 12 and 17 were objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, since independent claims 1 and 16 are submitted to be allowable over the cited art, no changes to the form of claims 4-8, 10, 12 and 17 are believed to be necessary.

Further, applicant respectfully submits that new independent claim 22 is allowable as well.

Applicant submits that the cited art, even when considered along with common sense and common knowledge to one skilled in the art, does *NOT* render unpatentable the aspects of claim 22 of the present application of displaying (in an image data collection system for collecting image data in an image data collection range including a periodically moving part of an object to

Hiroto KOKUBUN et al., Application No. 10/593,359   Dkt. 1141/76910
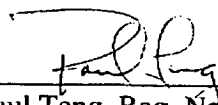Page 17

be examined) a graph indicating fluctuations in an estimated time resolution of an image

obtained on a part of the object with time information with a projected image of the object, in

advance of image data collection. Such aspects are shown by way of example in Fig. 6 of the

present application.

In view of the remarks hereinabove, applicant submits that the application is now

allowable, and earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper

should be considered to be such a petition. The Patent Office is hereby authorized to charge any

required fees in connection with this amendment, and to credit any overpayment, to our Deposit

Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner

is respectfully requested to call the undersigned attorney.

                                        Respectfully submitted,

                                        Paul Teng, Reg. No. 40,837
                                        Attorney for Applicant
                                        COOPER & DUNHAM LLP
                                        Tel.: (212) 278-0400

EXHIBIT A

to

AMENDMENT

(U.S. Application No. 10/593,359)